Lafayette Historical Society NEWS Enlightening Our Community

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Located on the Lower Level of the Lafayette Library

CONNECTING ALAMEDA AND CONTRA COSTA COUNTIES:
The Third and Fourth Bores

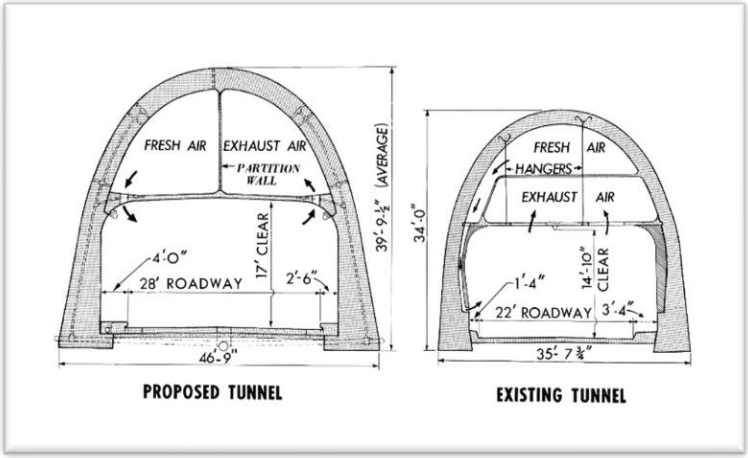
In the postwar era of the 1950s, the state had made improvements to Highway 75 (later Highway 24) at the approach to the Broadway Low Level Tunnel that changed it from a two lane road to a four-lane freeway. As the population of the cities east of the tunnel increased, so did the number of automobiles using the tunnel.

Construction on the third bore began in November 1961 about 150 feet north of the second bore of the original tunnel. This bore was designed to be larger than the two preceding tunnels. The state made sure there was ample land available should a fourth bore need to be constructed in the future. Scientific advances and information from the construction of the original bores were available to aid in construction of the third bore.

The third bore was completed in October 1964. It was approximately 300 feet lower than the existing Kennedy Tunnel and built on a four percnt grade descending from the Orinda end towards Oakland. Both ends were built on curves in order to provide a smooth transition into the approaches at each end. The new tunnel had a 28 foot roadway with a four foot sidewalk to the right of traffic and a two and a half foot curb on the left with 17 feet of vertical clearance.

The third bore cost nearly $25 million – more than twice the cost of the original two bores. After the third bore opened in 1964, the two original bores were each separately closed for needed maintenance which included installing fluorescent overhead lighting. The middle bore was then used to accommodate commute-direction traffic in the mornings and evenings. Pop-up barriers were added when the center bore's direction was changed.

By 1958, the State of California had approved an eight lane freeway from the Eastshore Freeway to the Broadway Low Level Tunnel. The Grove-Shafter Freeway was to be six miles in length and would help to accommodate traffic loads, which were estimated to increase to more than 54,000 vehicles per day by the 1960s.



This 1959 image shows a cross-section of the proposed third bore that reveals the changes made since the construction of the initial two bores of the tunnel; the roadway is wider, with additional space on the sides of the lanes; the height of the bore itself, as well as the ceiling height, is bigger to accommodate taller vehicles; and the ventilation system has been improved.

The first phase of the tunneling operation consisted of placing three small shafts(drifts) in the mountain. Ventilation, through large pipes, was needed to provide fresh air and to remove explosive gases such as methane and other noxious gases, including blast fumes.

The power plant that supplied the electricity for the construction was located near the western portal. Electricity supplied by PG&E ran compressors to furnish air to pneumatic drills, huge shovels, concrete mixers and saws, and charged batteries for the cars that hauled equipment.

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More than 100,000 tons of concrete were poured into the third bore. It took 9 months to pour the arched roof, the sides, the roadway, and the ceiling of the 3,300 foot long bore. Contractors leased special concrete holding equipment and guns to pour the arched roof and walls of the tunnel.

After the construction of the tunnel was complete, the walls and ceiling of the third bore were tiled with five acres of "sea foam" green tiles. The previous two bores of the tunnel had not been tiled due to cost. (There is a painted line on the wall of the Third Bore showing the dividing line between the two counties.....but be careful if you are looking for it while driving through the tunnel! Also notice that part of the roadway in Bore 3 is bumpy to drive over but part way through, the surface becomes smoother.)

On August 18, 1960, the Broadway Low Level Tunnel was renamed the Caldecott Tunnel, honoring Thomas E. Caldecott, who played a major role in the planning and implementation of the tunnel.

Just after midnight on April 7, 1982, a westbound driver lost control of her car and struck the tunnel wall in the third bore. When she got out to inspect the damage, traffic in the bore slowed. A tanker truck, carrying gasoline and traveling at a high speed, struck the car. An empty bus following the truck hit the car and the tanker. The bus driver was ejected from his vehicle and killed and the bus continued along in the tunnel and crashed near the exit portal. The tanker was leaking gasoline and was unable to move. Small fires started around the leaks. The driver was able to escape, but gasoline continued to escape into the drainage system. The downgrade of the tunnel caused the smoke to flow uphill toward oncoming vehicles. About 20 vehicles were able to get out of the bore but four vehicles were left trapped behind the burning tanker. Two people died in the initial crash, five were killed by smoke and fire, and two suffered from smoke inhalation. The fire raged for over a half hour burning about 8700 gallons of gasoline. Some of the spilled gasoline drained into Lake Temescal and the fire department was deployed to be sure that a fire wasn't ignited there. The temperature in the tunnel was estimated to have reached over 1800 degrees F. The tiles and grout in the tunnel were damaged by the intense heat. The tunnel was closed for repairs for several months.

In 1998, a number of agencies in cooperation with Caltrans, decided to study what could be done to alleviate traffic congestion on Highway 24. Meetings that took place included representatives from both Alameda and Contra Costa counties as well as from transit agencies from both counties. One option to be looked at would be to build another tunnel bore through the hills.

It was eventually determined that adding a fourth bore was needed. $420 million was initially projected as the cost for the Caldecott Fourth Bore Project, which included the construction of the Fourth Bore, realignment of the Westbound State Route 24 to the Northbound State Route 13 ramp, Kay Street Improvements, and landscaping. The completed bore was opened on November 15. 2013.

The German built Wirth roadheader was shipped from Europe to the Port of Oakland by way of the Panama Canal. It was able to excavate more rapidly and safely than many miners working by hand. The roadheader excavated from the Orinda, or eastern, side. A smaller roadheader worked from the Oakland, or western, side. Excavation progressed about six feet a day with workers reinforcing the walls before moving forward. The length of the excavated section was based on the surround-

ing geology. The harder the rock, the farther excavation could progress before support was needed.

Excavation on the Fourth Bore began in August 2010 on the westbound or Orinda side with the Wirth roadheader. About three quarters of the tunnel was excavated from the Orinda side because the geological formations were more stable. Excavation began on the eastbound (Oakland) side in March of the following year. The breakthrough of the top heading excavations took place on November 29, 2011, about 200 meters in from the Oakland side. In the Third Bore it is said that while driving west from Orinda, when the road stops being bumpy you are leaving the Orinda Formation.

Workers from Tutor-Saliba, Caltrans, and all subcontractors were required to use the brass board, a vestige of the mining industry, at the eastern portal. There was a "tag board" at the entrance to the tunnel. The board was used to indicate who was in the bore. Every time a worker went into the tunnel, he had to "tag in" or "brass in" by placing a brass tag with his name stamped on it on the "in" side of the tag board. When leaving the mine he "tagged out" or "brassed out" by moving his "brass" to the "out" side of the board. Brass tags were used because brass has a very high melting point. In the event of a catastrophic fire inside the tunnel during construction, the brass tags would identify the workers.

The strength of the tunnel roof was tested after shotcrete, a fast-drying concrete, had been sprayed on the walls and had hardened. After excavation, shotcrete was applied to walls and steel rods were installed around the perimeter of the excavation. The shotcrete and steel rods provided temporary support during construction. After a section had been tunneled, front-end loaders moved the tunnel spoils to long, flat mining dump trucks. The trucks off-loaded the spoils outside the tunnel portal. All spoils were tested for contaminated materials. Loaders filled larger dump trucks with clean spoils that were off-hauled to Treasure Island in San Francisco. Any contaminated spoils were loaded into trucks and transported to appropriate disposal sites. All tunnel spoils were tested for hazardous materials before leaving the site. Naturally-occurring hydrocarbons would be the most likely hazardous material if any were found. Paleontology samples were sent to the University of California, Berkeley for analysis.

Workers used metal twist ties to fasten pieces of rebar that provided reinforcement and strength to support the final concrete lining. Over 3.5 million tons of steel rebar were used in constructing the fourth bore which will enable the tunnel to withstand a strong earthquake on the Hayward Fault. Stainless steel panels were installed along the entire length of the new tunnel. Designed to be easily cleaned, the panels also help to focus the motorist's attention on the road ahead. Rebar was placed in the roadbeds to increase its strength. The new bore has a 10 foot shoulder on the right, and a two foot shoulder and three foot walkway on the left.

A new Operations and Maintenance Control building was constructed which is the "nerve center" for the four Caldecott tunnel bores, as well as the Webster-Posey Tube in Alameda County. The OMC is staffed 24 hours a day, seven days a week, by specially-trained operators. The Caldecott bores are numbered from left to right (from the Orinda side) with the original bores (1 and 2) on the left and the newer bores (3 and 4) on the right.

The ribbon cutting ceremony signaled the completion of the Fourth Bore. Speeches were given, medallions were unveiled, and thanks were given to those who made this project a success……coming in "on time and under budget!" The tunnel was officially opened to traffic on Saturday, November 16, 2013 at 4:25 am. The Fourth Bore has recently been named for Ellen Tauscher, longtime local Congressional representative.

Bay Area commuters witnessed major milestones in 2013 with the opening of the new span of the Bay Bridge in August and the opening of the fourth bore of the Caldecott Tunnel in November. Much like the opening of the Bay Bridge in 1936 and the Broadway Low Level Tunnel bores in 1937, the 2013 transit improvements continue to open the towns and cities east of the Oakland/Berkeley hills to travel and living….a far cry from the early wagon trips taken over winding dirt roads.

MEMBERSHIP UPDATE 2025

Welcome to our new members and to those who have recently renewed their membership or have made a donation:

Andy Monheit	David Van Etten	Sarah Blumenfeld
Stuart Robinson	Meredith Meade	The Rogers Family
Thomas Edwards	Diane Sasser	Patrick Kikkert
Becky Jenkins	Richard Whitmore & Jacinta Pister	Jay Lifson
Mike Raffo	Carolyn Alderette	Levi Hunt
Nancy Holtzapple	Todd & Betty LaPorte	Caren Armstrong
James Cervantes	Downing & Judith Exley	Gloria Duffy
Dick & Lisa Cohen	Sharon & Peter Lingane	Spencer & Tracy Brog
Nancy Goodmiller	Jeane & Roger Samuelsen	Amy Anderson

Thank you for your support of the Lafayette Historical Society.

ANNUAL MEMBERSHIP DUES

Your membership is exceedingly important as it makes it possible for our organization to pay annual rent to the City of Lafayette for our space and be able to pay for our phone, insurance, and other needed supplies. Donations are always appreciated.

Student Membership: $15 ~ Individual Membership: $30 ~ Family Membership: $60

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Thank you to Lauren Deal for sponsoring this newsletter issue!

WISHING EVERYONE A
Happy New Year!
From Happy Days Preschool to Acalanes High School alumni and now a proud Springhill & Stanley parent, my roots are firmly planted in Lafayette.
If a new home is part of your plan this year, I'm here to help. Let's make it happen—reach out ANYTIME!
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